The Business Journal of Vegetation Management November 1979/$1.25

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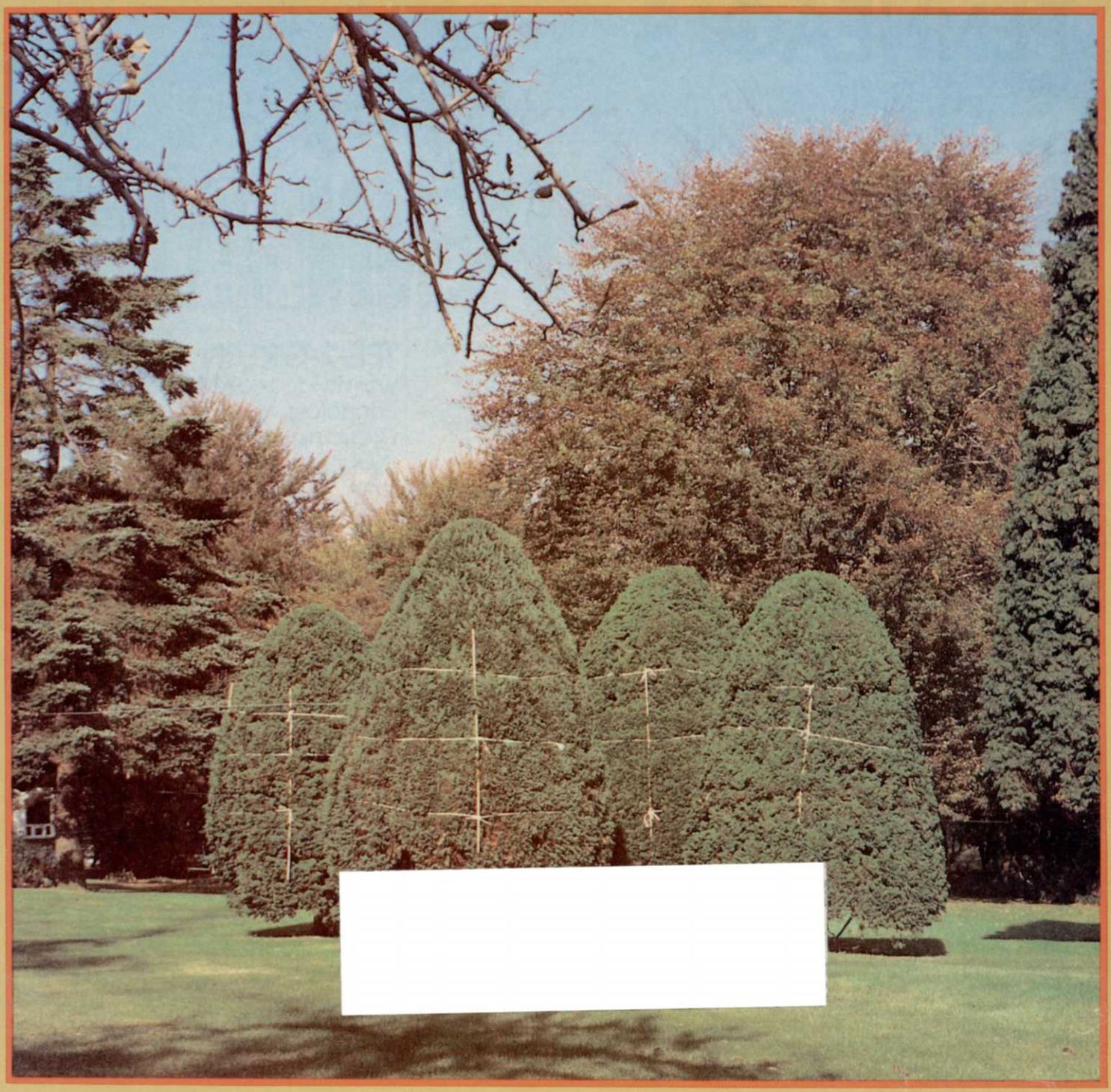

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Cover: Evergreens tied to prevent damage from snow. Photo by Maria Cinque.

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VIEWPOINT

by Bruce F. Shank, Editor

Smaller associations could use economies of a central service

This past month I spent days with leaders of both the National Arborist Association and the Professional Grounds Management Society. It is now clear to me that smaller associations may have fewer members and smaller treasuries, but their reason for being is as important as larger industry associations. Their significance is too often overshadowed by the larger groups with full-time professional staffs and sophisticated publications. As a result, association leaders who volunteer their time and energy occasionally feel less important than leaders in big associations.

Do we really need all these smaller, individual market associations? Can all Green Industries be organized and represented by the American Association of Nurserymen?

The answer to these questions may be found in the creation of our newest industry association, The Professional Lawn Care Association of America.

The lawn care businessmen who formed this group obviously felt their needs were not being met by existing associations. Furthermore, they needed a unified voice just in their industry to deal with fly-by-night operators who frequent all Green Industries, especially those in a rapid growth position.

In the first three months of existence, PLCAA created a code of ethics, circulated it to industry and consumer media, and reacted to one unsubstantiated charge from a regional sod producers association. They have promptly moved to guard their reputation as ethical businessmen and to show that their service is as vital to the Green Industry as any other.

Therefore, it is clear the existence of PLCAA is justified, as is the existence of other associations created to meet the needs of specific market segments.

At the same time we need to take care of the industry overall and to make association membership reasonably affordable.

Directors of landscape, arborist, and nursery associations meet periodically as a council. All national industry associations should take part in this council.

Perhaps one of the problems this council should discuss is the problem of paying for numerous association memberships. Due to rising costs, both the member and the association are financially pressed for funds. Individual membership associations are feeling the pinch the most.

> There is a need for specific market associations and an overall organizational body.

The subject of associations and membership needs vast attention. There are many aspects to explore, such as interassociation cooperation, representation in governmental affairs, and joint sponsorship of industry research and development.

As there is a need for the specific market association, there is need for an overall organizational body. This organizational hub could economically provide association needs such as printing, billing, and technical data. There are many things it could do to organize, support, and direct the flow of industry resources for the benefit of all markets.

Perhaps this is dreaming, impossible, or simply naive. Perhaps we are all too wrapped up in our own worlds to cooperate and rock the boat. But it makes sense and it could happen if the interest is there.

The central body already exists in the American Association of Nurserymen and allied agencies. If AAN is willing and the other Green Industry Associations are willing, it's worth a shot. **WTT**

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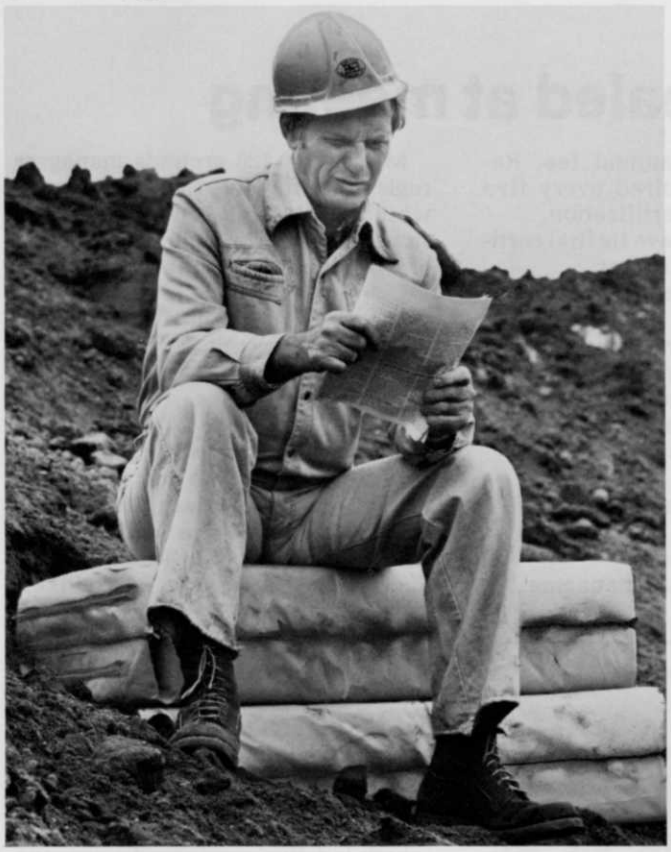

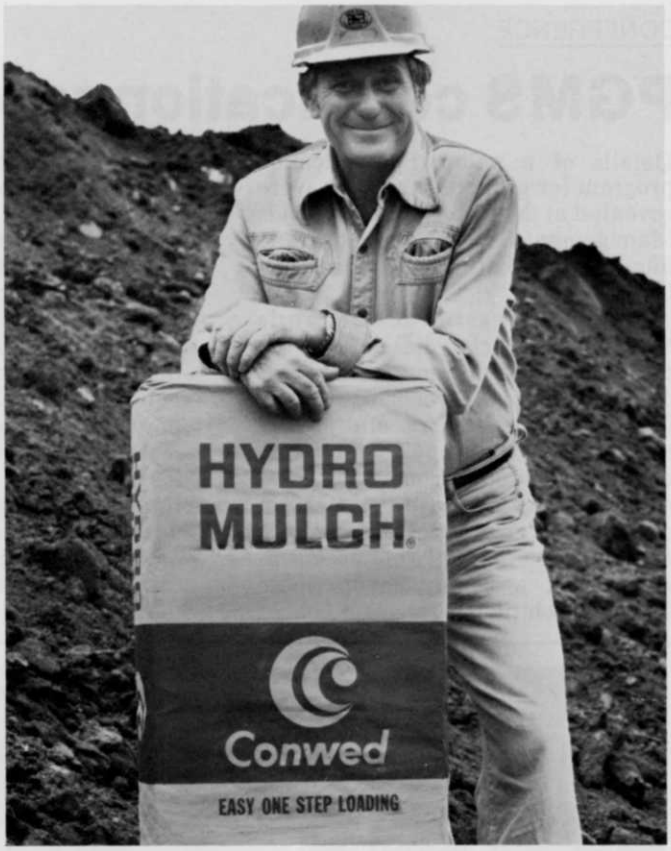

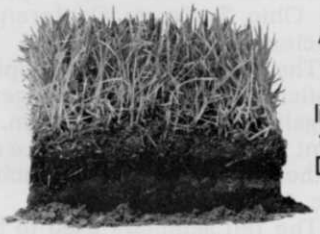

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GREEN INDUSTRY NEWS

CONFERENCE

PGMS certification revealed at meeting

Details of a national certification program for grounds managers were revealed at the 67th Annual Grounds Management Conference and Trade Show at the Baltimore Hilton Hotel Oct. 21-23.

The Professional Grounds Management Society has devised the program to set minimum standards of competence, to recognize qualified grounds managers, and to protect employers and customers from unqualified grounds managers.

The program requires certain educational and experience levels, provides a manual of essential knowledge, and requires periodic testing. Each phase carries a charge in addition to an annual fee. Reexamination is required every five years to maintain certification.

PGMS hopes to have its first certified members in one year.

Areas to be covered in manuals and testing are:

—principles of grounds management
—design/management relationship
—equipment management
—personnel management
—materials and supplies management
—financial management
—energy and water conservation
—environmental issues
—technical aspects of managing plants

More than 125 grounds managers registered for the three-day event which included educational sessions, business meetings, and tours of Maryland landscapes.

Money management, an update on tree research by Shigo and Shortle, and low maintenance plants were popular topics.

Persons interested in the certification program or the next PGMS annual meeting in Kansas City in 1980 should contact Allan Shulder, Professional Grounds Management Society, 19 Hawthorne Ave., Pikesville, MD 21208, 301-653-2742.

Panel members at the 1979 Winter Overseeding Round Table in Biloxi, MS, were (left to right): Dr. Earl Barrios, Louisiana State University; Dr. Don Blasingame, Mississippi State University; Dr. Ray Dickens, Auburn University; Dr. Jeff Krans, Mississippi State University; Howard Kaerwer, Northrup King Co.; Dr. Joe Duich, Pennsylvania State University; Dr. Coleman Ward, Auburn University; and Dr. Euel Coats, Mississippi State University.

SEED

Overseeding experts gather in Mississippi

Thirty turf professionals from Mississippi, Alabama, and Louisiana and Dr. Joe Duich from Pennsylvania State University gathered in Biloxi, MS, to discuss winter overseeding in September. The meeting was sponsored by the Seed Production and Introduction Corp. (SPIC) marketer of Pennfine perennial ryegrass.

Turfgrass experts serving on the panel discussion were: Dr. Jeff Krans, Dr. Euel Coats and Dr. Don Blasingame of Mississippi State University; Dr. Coleman Ward and Dr. Ray Dickens of Auburn Univer-

Continues on page 40

GOLF

GCSAA sets seminars prior to Ohio show

The Golf Course Superintendents Association of America has scheduled five seminars to precede the Ohio Turfgrass Conference in Cincinnati, OH.

The seminars on such topics as pesticides, personnel management, irrigation, landscape design, and plant nutrition will take place at the Netherland Hilton in Cincinnati, Dec. 2-3.

The fall seminars used to be offered at different locations around the country.

The pesticide seminar will be offered by Dr. Harry Niemczyk of Ohio Agricultural Research and Development Center and Dr. James Reinert of the University of Florida Agricultural Research Center.

William Nelson of the University of Illinois and Dr. Charles Sacamano of the University of Arizona will present the landscape seminar.

Ron Frame, a consultant from Oklahoma City and Golf Business

Continues on page 8

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Landscape Contractor News

ALCA annual meeting topics announced

Topics for the Associated Landscape Contractors of America annual meeting set for Feb. 3-8 at the Town and Country Hotel in San Diego have been announced. The theme of the meeting is "New Directions for the New Decade."

Specialty workshops for markets of potential for the 1980's include interior landscaping, design/build, new chemicals, erosion control, lawn care, new equipment and irrigation maintenance.

Business communications and creative thinking are special topics with special speakers. The yearly highlights including the Environmental Improvement Awards, trade exhibits by manufacturers, and membership meeting are planned.

On the social side, ALCA has arranged tours to Tijuana and LaJolla, buzz sessions to exchange ideas, and the President's banquet.

A seven-day adventure to Hawaii has been arranged for after the convention. The trip will include the islands of Hawaii, Maui and Kauai.

For information on the show contact Associated Landscape Contractors of America, 1750 Old Meadow Rd., McLean, VA 22102.

Link new PGMS president

William H. Link, director of landscaping for Century Dev. Corp., Houston, TX, was elected president of the Professional Grounds Management Society at its recent annual meeting in Baltimore. John Vorst, parks supervisor for Tenafly, NJ, was elected president-elect. Earl Wilson of Maineville, OH, was elected vice-president and Robert Fisher of Mount Vernon, VA was elected treasurer.

Magazine columnist will conduct a seminar on personnel management.

The plant nutrition seminars will be taught by Dr. John Dunn of the University of Missouri, Dr. Ralph Engel of Rutgers, and Dr. Paul Rieke of Michigan State University.

Rain Bird's David Davis and Toro's William Speelaman will conduct the irrigation seminar.

Interested persons should contact GCSAA, Larry Goldsmith, 913-841-2240.

SEED

Penncross, Penneagle sales limited to Toro

The marketers of Penncross and Penneagle creeping bentgrasses, Tee-2-Green Corp., has elected to sell the seed only through Toro distributors, unless a Toro distributor in an area turns down the chance.

B.H. Melton, president of Tee-2-Green, said the arrangement was made with Toro to lower distribution costs and to make the seed readily available to the consumer.

If a Toro distributor does not choose to participate, the dealership in his area will be offered to a seed handler who calls on golf courses in the area.

The new marketing process will provide Tee-2-Green with better sales information and will enable the company to tailor marketing programs to usage areas.

New bermudagrass resists winter-kill

A strain of bermudagrass discovered on a fairway in 1972 is showing good winter hardiness, outstanding vigor, and an attractive medium-green color in field tests conducted by Virginia Polytechnic Institute.

Called VPI C-1, the bermudagrass forms a tight sod that tends to remain weed free and appears to tolerate traffic well.

Comparison plots are maintained at the Southern Piedmont Research and Continuing Education Center near Blackstone, VA. L.H. Taylor, professor of turfgrass and R.E. Schmidt, associate professor of turfgrass hope the strain can soon be named and made commercially available.

Kidwell Turf Farms in Baskerville, VA, assisted in providing material for the tests.

CONFERENCE

1,500 expected at Ohio turf program

More than 1,500 turf and grounds specialists are expected to attend this year's Ohio Turfgrass Conference and Show at the Cincinnati Convention and Exposition Center Dec. 4-6.

The 150 booths in the exhibit hall have been sold out since July.

More than 20 hours of educational sessions have been planned. These sessions are divided into golf course and professional lawn service.

Educational sessions cover topics such as personnel management, pesticide and equipment developments, an update on liquid lawn care, and granular applications for professional lawn care.

Lodging reservations may be made at the Stouffer's Cincinnati Towers (513-352-2100). For further information contact the Ohio Turfgrass Foundation, 1827 Neil Ave., Columbus, OH 43210, 614-422-2591.

NURSERY

Industry loses two great leaders

Nurserymen mourned the death of two of the industry's greatest contributors in September; Henry Kohankie of Lake County, Ohio and Charles McFee, Jr., of Richmond, Virginia.

Although he retired in 1954, Henry Kohankie was regarded by Ohio nurserymen as a living legend because of his wide variety of types

Continues on page 12

Paspalum vaginatum, a variety from Australia, is the subject of this turf plot demonstration by Orange County Farm Advisor J. Michael Henry during the University of California Field Day in Santa Ana in September. The new variety shows more salt tolerance and good winter color compared to other southern California turfgrasses.

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Not only that, Jacobsen distributors hold field seminars and offer training to those customers who handle their own routine maintenance.

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GOVERNMENT UPDATE

Topsin M beats Tersan through RPAR

The Environmental Protection Agency has determined that Topsin M (thiophanate-methyl) needs no additional restrictions currently, although EPA is still pushing for some new restrictions for Tersan 1991's active ingredient benomyl. Both chemicals were in the process known as rebuttable presumption against registration.

EPA is leaning toward an extra warning on the benomyl label and use only in water soluble packets. It also wants more testing of benomyl. Du Pont argues that many users of benomyl can't use water soluble packages for time and equipment reasons.

Topsin M's active ingredient, thiophanate-methyl, has made it through the RPAR process without additional requirements or restrictions. EPA, however, is still checking risks of a metabolite of thiophanate-methyl.

The two products are in the same chemical family and have many of the same uses. Tersan 1991 is labelled for Fusarium, dollar spot, stripe smut, and brown patch. Topsin M, a Pennwalt product, is labelled for dollar spot, Fusarium, stripe smut, and brown patch.

AAN continues fight for chlordane

The American Association of Nurserymen is trying to obtain an extension to a 1978 agreement with EPA to provide chlordane for specific nursery uses through 1979. The uses are those necessary to meet state and federal quarantines for Japanese beetle, fire ant, and black vine weevil on nursery plants. AAN is currently working with USDA for the extension.

and sizes of plant material on his 814 acre nursery. His plant catalogs were often used as reference manuals by horticulture students and landscape contractors in the area around Cleveland. Kohankie received many honors in his life, including life membership in International Society of Arboriculture.

Charles McFee, Jr., was executive-secretary of the Virginia Nurserymen's Association. McFee provided Virginia Nurserymen with valuable direction and management training. VNA president Ralph Hanna, Jr., said McFee has been a sincere friend to all nurserymen in and outside of Virginia.

TREES

Tailgate safety program introduced by NAA

The National Arborist Association has developed and now offers a 33-lesson tailgate safety training program, based upon standards established by the American National Standards Institute in cooperation with NAA.

The program is designed to provide weekly training programs for employees in the field. Each lesson takes 15 to 20 minutes and includes an employee sign up sheet to show that each employee received the training. Safe use of every piece of tree equipment and job site precautions and marking are included in the lessons.

The programs are now available from NAA, 3537 Stratford Rd., Wantagh, New York 11793, 516-221-3082.

Larry Holkenborg, president of NAA gave the first lesson of the series to his crew in Sandusky in October.

National Arborist Association executive secretary Bob Felix (left) presents first copy of the Tailgate Safety Training Program to NAA President Larry Holkenborg at Holkenborg's business in Sandusky, OH. Holkenborg gives the first lesson to his crew (bottom right). One key of the program is the crew member signs a sheet saying he completed each session (bottom left).

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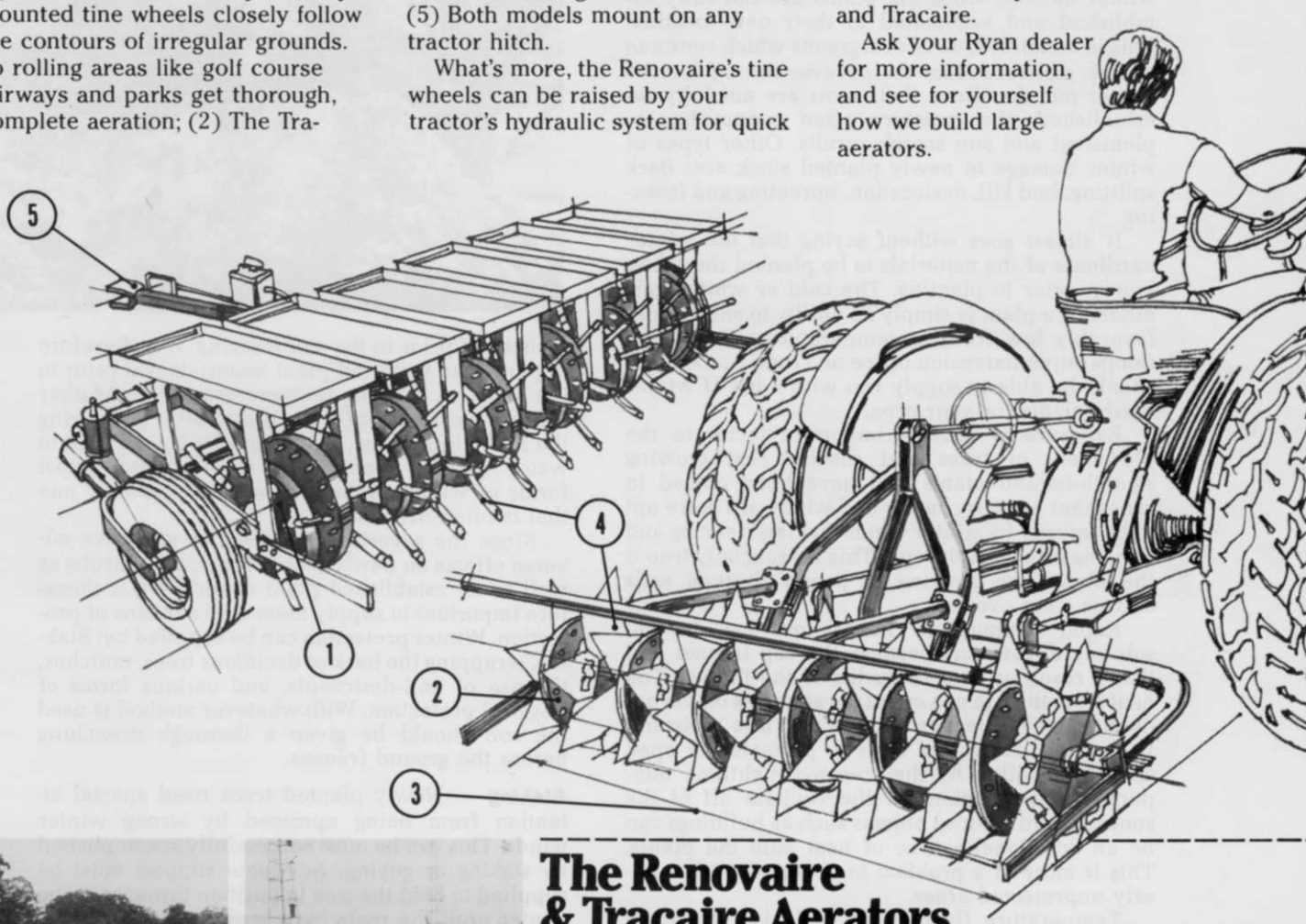

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PROTECTING FALL PLANTINGS FROM THE RAVAGES OF WINTER

By Maria T. Cinque, Extension Specialist, Nassau County, NY

With the increasing popularity of fall planting of evergreens and deciduous materials, in some areas of the country, winter protection of those plants is more important than on spring planted materials. This is not to say that winter protection shouldn't be used on springtime plantings or established trees and shrubs, for these can certainly be damaged by severely cold, windy and snowy weather conditions.

Newly planted materials are in more danger of winter damage since the plants are not fully established and acclimated to their new location. This is certainly true of evergreens which continue to lose moisture from their leaves throughout the winter months. Since their roots are not fully reestablished, the moisture often cannot be replenished and sun scorch results. Other types of winter damage to newly planted stock are: Bark splitting, bud kill, desiccation, uprooting and freezing.

It almost goes without saying that the winter hardiness of the materials to be planted should be known prior to planting. The cold or winter hardiness of a plant is simply its ability to survive unfavorably low freezing temperatures. Your local Cooperative Extension office or Trade Association should be able to supply you with a list of winter hardy plants for your area.

Exposure is another important factor in the placement of trees and shrubs. Fast growing smooth-barked plants that have been placed in areas that are very sunny and windy are more apt to be injured by winter winds and the freezing and thawing effects of the sun. This is especially true if the plants are growing in poorly drained soils and/or were overfed.

Rapid temperature fluctuations can be absolutely devastating because the sap freezes and thaws resulting in a rupturing of the tissues. The heat from the sun can cause the stomates on the undersides of the leaves to open and lose moisture. It can also cause leaf buds to prematurely open and to be killed by the freezing nighttime temperatures. Reflections of the sunlight off of the snow or light colored objects such as buildings can be an additional source of heat onto the plants. This is more of a problem to evergreens in southerly unprotected areas.

Temperature fluctuations will also effect the root system, when the soil moisture is frozen it is unavailable to the plant and desiccation may result. The injury from alternate freezing and thawing is due to the heaving of the soil and by the actual ripping of the root system in the process. Early warm temperatures can bring about the early blooming of trees which then have a high probability of being injured by frost.

Plants going into the winter without sufficient soil moisture are more apt to be effected by freezing soil temperatures than those whose soil was

moistened prior to the soil freezing. It is therefore important to water all plant materials just prior to the onset of freezing temperatures when Mother Nature doesn't do it for us. If the soil is dry during the mid-winter thaw, this would be a good time to water again. It is one of the simplest and easiest forms of winter protection but unfortunately one that is often overlooked.

Since the severity of the winter can have adverse effects on newly planted trees and shrubs as well as on established plant materials it is therefore important to supply them with a means of protection. Winter protection can be supplied by: Staking, wrapping the bark of decidious trees, mulches, the use of anti-desiccants, and various forms of physical protection. With whatever method is used the soil should be given a thorough drenching before the ground freezes.

Staking — Newly planted trees need special attention from being uprooted by strong winter winds. This can be most successfully accomplished by staking or guying. Adequate support must be supplied to hold the tree in position throughout the winter until the roots have grown enough to support the tree. Guy wires or supports are usually left on for one to two growing seasons, however they should be checked after the first year to see that they are not girdling the tree. If they are found to be cutting into the bark the wires should be loosened.

Care should be taken in placement of guy wires on trees in public areas for they may be a source of danger to someone walking by and tripping over them.

Continues on page 16

Sure, there's more to maintaining quality, disease-free turfgrass than a couple of fertilizer applications. But turfgrass scientists across the country are reporting that a fall application of IBDU (31-0-0) can produce turfgrass with better root development and less disease problems.

Dormant turfgrass plants continue to produce rhizomes and roots, even though vertical growth has stopped. During this time nitrogen should be made available to the turfgrass plant as carbohydrates are naturally accumulating. Thus, scientists say, the optimum timing for nitrogen applications is during the fall and early winter months.

IBDU (31-0-0) is ideally suited for dormant nitrogen fertilization. Because of it's slow release characteristics based on hydrolysis, IBDU releases nitrogen later in the fall and earlier in the spring promoting better rhizome and root growth. A fall fertilizer program using IBDU should produce healthier more vigorous turfgrass plants and reduce the severity of several turfgrass diseases.

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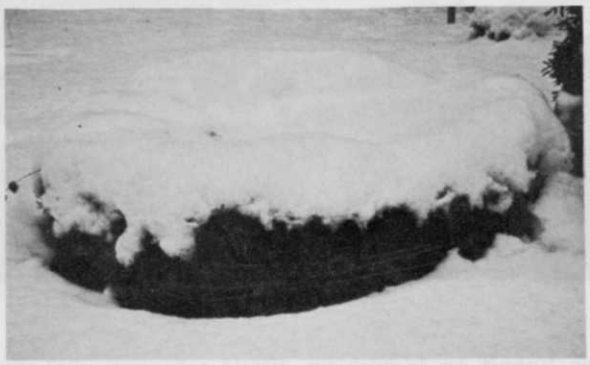
Wrapping — Wrapping the bark of newly planted tender trees protects the trunk from the direct rays of the sun which could, if left unprotected, result in the bark splitting. This is especially a problem on the southerly exposed portion of the tree. During the daytime, southerly exposed bark warms up considerably (30 to 35 degrees higher than the north side) only to be subjected to freezing temperatures again at night, resulting in the splitting of the bark. The splits in the bark then serve as a portal of entry for insects and diseases. Therefore a commercially available tree wrap or burlap should be used to protect the tree from the drying effects of the sun and winter wind. The trees should be shielded for at least the first winter and perhaps the second.

Mulches — A winter mulch is used to minimize root injury from the freezing and thawing effects of the winter which can cause an uprooting or heaving of newly planted and established trees and shrubs from the soil. A mulch applied just after the ground freezes can prevent this from happening by maintaining the soil at a more even temperature. The mulch can be applied after the soil freezes in order to keep the soil cold rather than preventing it from becoming cold. A mulch will also help to retain soil moisture. Pine bark, wood chips, hay, clean straw, oak leaves, or evergreen branches can be used as winter mulches. Whichever mulch is used a few inches of it should be spread evenly over the root zone.

Anti-Desiccants — Anti-desiccants are another means of providing winter protection to evergreen trees and shrubs. They form a protective film over the plant which slows down the rate of transpiration and reduces water loss when the ground is frozen and water cannot be taken up by the plants. This is especially helpful on warm winter days when the plants transpire at a fairly high rate while the roots are unable to replenish the water loss due to the soil being frozen. The result is that the foliage becomes scorched. Anti-desiccants, if applied properly can help prevent the leaves from becoming scorched.

There seems to be a great deal of controversy among people in the industry over the use and the number of applications of anti-desiccants needed to give positive results. However it is felt by most experts that one application is usually not sufficient when applied to evergreens in the colder climates. Anti-desiccants seem to be most effective when applied two to three times: Late fall or early winter, again in mid-winter and if possible a third application in late winter. The mid-winter application is sometimes difficult since the temperature must be above forty degrees Fahrenheit and stay above freezing until the material has completely dried on the plants to form a wax-like coating. If it is too cold the anti-desiccant may freeze on the plant and be completely ineffective.

Continues on page 38



If this plant were not tied, the weight of the snow would have broken some of its branches.

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MUNICIPAL MANAGERS LEARN TO COMPETE FOR BUDGET FUNDS

By John Kerr, Assistant Editor

In every municipality in the U.S., one person or a team of superintendents commands the grooming of public buildings and grounds. These people — public works directors, landscape supervisors, urban foresters, park and recreation directors, and an array of other titles which represent similar responsibilities — must maintain trees, turf, parks, street medians, and right-of-ways. Like park directors, these managers must contend with reduced budgets and naive legislators. Yet unlike park directors, they have little if any way to produce revenue and are often considered extravagant spenders.

Municipal managers should provide concrete evidence of their worth and its effectiveness, like a city engineer who shows blueprints for a bridge at budget time.

Municipal grounds managers are learning from their competition — every other tax-paid department — how to accrue precious budget funds. They are organizing their work force, innovating new programs, and inventoring vegetation down to a seedling. This provides concrete evidence of their work and its effectiveness, like a city engineer who shows blueprints for a bridge or building, and gives leverage at budget time.

"We have convinced the policy makers it pays to maintain at a quality level," says Robert Skira, city forester in Milwaukee, WI. "There's a fine edge between quality and everything else. Once you slip past quality and into routine maintenance you're almost spending the same money, but you can never get on top of it. That puts you into an irreversible state in which you're always behind. If you had a little more money you could stay ahead."

At budget time, Skira brings an accurate inventory of his plants, evergreens, and ornamental trees; graphic descriptions of what his bureau could do and how much better it would look with additional funds; and goals and objectives for each particular project. "Legislators simply say yes or no," says Skira. "But at least they have the big picture and we try to make them acutely aware of the impact if they don't accept a particular level of service that we feel is economically feasible and at the same time adds to the environment."

An example Skira gives is his goal for the city's 305,408 street trees: "to continue to reforest and maintain the quality of the urban forest with all its environmental benefits at a level that will increase both the value of the trees and the real estate value of Milwaukee." He wants to set a value for every tree and then project what that value will be over a 10-year period if the trees are maintained properly. He will show through the International Society of Arboriculture's table what the increase in value will be.

With this plan mapped out, Skira shows exactly how important it is for a reasonable level of maintenance. "For some reason or other, foresters have not been able to sell their products on the basis they too have a life span. We say what the thing is, how much it will cost, what it's worth, and how you should be spending "x" dollars to preserve those values," he says.

He keeps his inventory constantly updated to consistently build a sound argument for the policy makers. Newly-developed areas are added to the forestry bureau's charts. Skira lobbies for his cause and realizes the importance of record keeping and thorough maintenance studies. "These kinds of things are necessary in today's world to manage vegetation," he says.

Skira also gets involved in decisions on new construction projects which he will eventually be maintaining. He may discuss the advantages of fashioning a boulevard out of a new or renovated road. This makes a roadway safer, the main consideration, but also increases the property value since the new design will sport flowers, ornamental trees, and shade trees. By being there at the planning stage, he can also save the city money on something like a sprinkler hookup, which is much cheaper to do before all construction begins.

Skira lobbies and realizes the importance of record keeping and thorough maintenance studies.

Converting from manual valves to pop-up head sprinklers and hydraulically-operated valves, saves labor and water for the city. Flower beds in boulevards have been trimmed down so large mowers speedily cut the grass between the beds and the road.

Continues on page 20

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Dahlia, Lily, Tulip	Blight (*Botrytis* spp.)
Holly	Purple Spot
Hollyhock	Leaf Spot, Anthracnose, Rust
Honeysuckle	Blight (*Herpobasidium* spp.)
Iris	Leaf Spot
Pansy	Anthracnose
Rose	Black Spot
Snapdragon	Rust
Zinnia	Leaf Blight
Azalea, Camellia, Rhododendron	Petal Blight
Chrysanthemum	Petal Spot (*Botrytis* spp.)
Flowering dogwood	Anthracnose
Gladiolus	Leaf and Flower Spot (*Curvularia* and *Botrytis* spp.)
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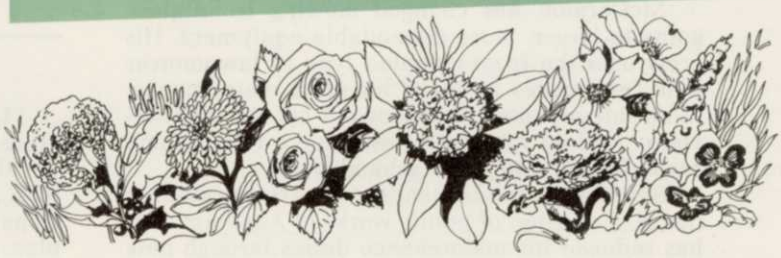

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New landscaping in Milwaukee includes more woody perennial material and less annuals. Skira's crew uses lots of wood chips around trees to preserve water and reduce trimming. The crew has discontinued heavy fertilizer treatments and combined fertilizing with herbicides in one fall spray. With small gasoline-engine trucks that have a hydraulic pump, hydraulic stick saws have been added, which triple the previous amount of low-level pruning.

Skira is planning to computerize his inventory because he thinks that will make his records unquestionable. Thomas McDermott, landscaping and cemetery superintendent of Charlotte, NC, has already begun a computerized inventory for his tree maintenance program. Computers tell him where the trees are, what they are, how large, and what problems they have. This helps him manage problems before citizens complain and gives him a systematic pruning schedule.

Careful track of costs will help tell us whether to contract out some maintenance.

McDermott is trying to keep a study of each project he has going every year. "If the cost is out of line for what it should be, then we can do something about it," he says. "If we don't know what our costs are, we don't know we have a problem." Careful track of costs will help determine whether it's beneficial to contract out some maintenance. "Then we could concentrate more on the aesthetic high visibility, high maintenance projects we might have without additional personnel."

Although McDermott has not had his budget cut, he's not getting any new people for his crew. He has tried to compensate through an extensive spraying program and efficient use of equipment.

"We can weed a bed chemically in probably one-fifth the time it would take our hands to do it," he says. Roundup has been very useful, particularly in beautification projects in which he doesn't fear for neighboring plant material. Soil sterilants, because of their volatile nature, work well on Charlotte's right-of-ways — Pramitol for street right-of-ways, Treflan as a preemergent weed control, and Casoron for winter weed control.

McDermott has changed mowing techniques, going to larger, more dependable equipment. His crew uses the front-mounted type of lawnmower that Toro makes to speed his grass maintenance. Mott side-mounted flail mowers cut the right-of-ways. And so he doesn't ever have to cut some areas, McDermott plants groundcover.

San Morita, superintendent of parkway maintenance, a division of public works in Anaheim, CA, has reduced his maintenance duties through new types of irrigation systems and different plant materials. "We are going more to automation in grounds maintenance," says Morita. He is experimenting with drip systems and hi-pop sprinkler heads to irrigate with less water.

In the median islands around Anaheim, the trend is away from turf. Morita is planting materials like raphiolepis and Indian Hawthorne, and groundcover which are not individual plants like gazanias but others such as star jasmine and lantanas. The object is plants with color but not just annual flowering.

Since he has limited funds to work with, and feels that he is using his technical expertise and equipment to the fullest, Morita is now concentrating on employee incentive. "The main aspect of it is to keep as many employees on the job as possible and then motivate them through some type of program," he says.

He is working hard on employee safety. "First of all, if a man is hurt, he's suffering and also can't perform the job he was hired for." Last year Morita reduced the injury frequency rate over 50 percent through clear safety standards and regularly scheduled meetings to review them. What was before very general is now carefully written so everyone can understand. "If there's a violation, we'll get on it and take action," he says.

"Second, we want to give an employee an opportunity to attend seminars to improve his talents and skills. We want to give responsibility to the individual, make him a person, not a number," Morita says. Outstanding employees have the opportunity to attend equipment shows and seminars on topics such as safety or pruning. The International Society of Arboriculture sponsors Street Tree Seminar Inc., monthly meetings which Morita's crew attends.

In Detroit, a city that is rebuilding much of its downtown, many landscaped grounds are being added. Two people who head up the maintenance work — Karl Ackerman, senior associate forester, and John Tatti, senior assistant forester — are trying to influence the new designs for low maintenance.

Outstanding employees have the opportunity to attend shows and seminars on topics such as safety or pruning.

"Landscape architects keep putting in spacious areas and lots of trees," Tatti says. "They have to develop different techniques for us to maintain with less people. All of maintenance is going to come down to low cost." Ackerman says he reviews plans of even the private landscape firms to try to

eliminate details which will cause troublesome maintenance in the future.

Ackerman is figuring the 1980-81 budget with a 16 percent reduction. "We are going to be hard pressed to do grounds maintenance work on areas like ball diamonds, playground equipment, and that sort of thing," he says. He will be losing 40 to 45 people for the fall/winter season and that will curtail leaf pickup and late autumn mowing.

Tree care is fairly safe of budget cuts because 90 percent of its funds come from the state Gas and Weight Tax and other reimbursements outside the city. Under the Federal Block Grant Program, Detroit can plant 20,000-25,000 trees a year along residential streets. The city contracts out tree and stump removal and tree planting.

Snow removal, ice rink maintenance, and grounds funds all come from local taxes, which will mean some drastic cutbacks. Fertilizing has been almost eliminated except in the downtown area. The two foresters have a soil sterilization program along fences which they will try to keep and have installed mowing strips under fences to prevent grass from growing.

In the past few years, the city has begun to install splash strips along roadside curbs, but not enough in Tatti's opinion. "Wherever they use salt they're killing off all the grass and plant material along the curbs. They're going to have to design splash strips all over with a little more pitch to them. It's folly to plant seed or sod in the spring and have it killed off in the winter."

Tatti began an early morning operation during the summer with a seven-man crew that was willing to work on any type of project. They started at 4 a.m., hours before the traffic began to inhibit their mobility and freedom to work. Tatti figured he covered more in three hours than a regular shift crew could do in five. Without traffic, they could park heavy vehicles on the street instead of on top of the grass.

No maintenance operation in the country is immune to the bite of inflation and budget reductions, but some have been hit harder than others. One that took it on the chin this summer is Dallas, TX, where gasoline for park and street maintenance was reduced 80 percent. Eddie Hueston, superintendent of park maintenance, said the situation caused a whole new schedule of priorities and a shakeup of traditional methods, but the final effect may be positive.

Safety items were put at the top of all priorities, followed by public health, landscaped areas that were irrigated, active recreation areas, large picnic areas, and down at the bottom was routine forestry work and mowing of median centers that weren't irrigated. Since everybody noticed the unkept medians, these became the most controversial. Hueston says, "Some of the furor may have helped the city fathers realize some areas are pretty sacred and could not be touched."

But no gas from mid-June through August also meant a total reorganization of the maintenance program. "We had to abandon our method of thinking for all kinds of maintenance," Hueston says. The first thing to do was to break down the five city districts further so there would be less travelling. In smaller parks, individual caretakers have been reinstalled to take care of the whole area and equipment has been redistributed. "We're probably getting better care of our parks now," Hueston says. "There's quite a bit of pride if one person knows that's his park."

In Dallas, gasoline for park and street maintenance was reduced 80 percent and caused a shakeup in traditional methods.

Hueston says that he actually caught up on tree maintenance in many areas, mostly in corrective tree work. "We sent people into a large park and they didn't drive around a lot to different projects but just worked right there with hand tools." The crew noticed what had to be done in nearby areas. Turf care didn't suffer much because it fell into the category of landscape areas, which were a priority.

"It made us take a real hard look at how efficient we had been," he says. "I think the overall effect caused us to look at how we were doing things and we began to look at them in a whole different manner. I think we probably trimmed down some areas better than we had been doing before. We kept better track of things because we had to account for them."

Although Hueston's department is not facing the same cutbacks for next year, it still must scrutinize how much to spend on gasoline with the possibility it may be 50 percent of the budget. He thinks it is very likely that he will continue the reorganization undertaken over the summer. He must decide what emergency measures to retain and still keep quality maintenance. It is a situation many others may soon face.

Involving the community is one way Thomas Metz, superintendent of lands and buildings of Bowling Green, OH, has received response to a lack of manpower. With only five people and some CETA workers to maintain 300 acres of parkland and plant 500 trees a year, Metz took his plight to the downtown merchants.

Since all the city's trees are bought with revenue sharing funds, the dilemma for Metz once he planted the trees, was to be able to maintain them. So he started an adopt-a-tree program. He went to the downtown merchants and asked if they would maintain, water, and keep litter from around a tree outside their business. The response was very positive and Metz estimates the success rate of trees has increased from 60 to 76 percent.

"A lot of people didn't know we existed," Metz says. He and the tree commission visited many people and issued pamphlets with their names and

Continues on page 38

TESTS INDICATE PERSISTENCE OF VEGETATION ON TOXIC SPOILS

By Paul Sutton, Professor of Agronomy, Ohio State University

Many studies have been conducted on the establishment of vegetation on acid coal mine spoils in the eastern United States. Acidity results from expc re of sulfur-containing minerals to air during the ining operation. When exposed to air and moist , iron disulfides oxidize to produce soluble sa and sulfuric acid. Exposure of toxic materials is now eliminated by selective placement of spoils during mining. Under present mining methods, the toxic materials are buried and materials suitable for vegetation, usually topsoil, are replaced on the surface.

Topsoil, limestone, and municipal sewage sludge were tested as aids in establishing vegetation on acid coal mine spoils at the Eastern Ohio Resource Development Center, Unit II, near Caldwell, Ohio. The test area was contour strip-mined for number nine coal in 1966 and reclamation grading was completed in 1967. The overburdened material consisted of soil, sandstone, and a dark gray shale. The spoil material on the surface of the spoilbank had a pH of 2.3 and was composed of sand (25.1%), silt (43.7%), clay (31.2%), and sulfur (1.5%). It contained 45.8 meq/100 g (milliequivalents per 100 grams) of exchangeable hydrogen and 6.6 meq/100 g of extractable aluminum.

The toxic materials are associated with the gray shales in the overburden between and above the coal seams. The surface layers of this spoilbank are predominantly gray shale. The spoil was very acid and initially contained a high level of soluble salts (40,000 ppm). Although the analyses indicate approximately two-thirds of the spoil was sand and silt, the material was very compact and had very poor structure. This prevented rapid infiltration of water. These dark-colored spoils may develop high surface temperatures, lethal to emerging seedlings.

It is important that these areas have good vegetative cover to prevent erosion and reduce acid mine drainage. Sediments from this area have filled nearby stream channels and road ditches. Also, leaching of salts and acid will improve the spoil if erosion is controlled to prevent the removal of the weathered materials. In a leaching study conducted in the laboratory, the spoil remained highly acid after large amounts of salts and acid had been removed. However, leaching will reduce the amount of limestome required to raise the pH to a level where plants can be successfully grown.

Paul Sutton is professor, Department of Agronomy, Ohio State Agricultural Research and Development Center, headquartered at Caldwell, Ohio. This article is reprinted from the Sept.-Oct. 1979 issue of Ohio Report on Research and Development.

Topsoil and Forages

In spring 1968, eight plots (10 ft. x 10 ft.) were established by covering the spoil with soil material having a pH of 6.5, 14.5 lb/A of available P (phosphorus), and 288 lb/A of exchangeable K (potassium). The material was an Upshur soil removed from a road bank cut. A border of wooden planks held the soil in place. Depths of uncompacted soil were 2, 4, 6, 8, and 10 inches. Plots were seeded with Kentucky 31 fescue. The following spring, Korean lespedeza and orchardgrass were also seeded.

Some vegetation was established on the 4, 6, 8, and 10-inch depths of topsoil, but a good vegetative cover was sustained only on the 6, 8, and 10-inch depths.

First year growth of Kentucky 31 tall fescue was poor and a good vegetative cover was not obtained. The second year, growth was mostly from Korean lespedeza, suggesting a need for additional nitrogen for good growth of grasses. Using topsoil with a higher organic matter content would have reduced the need for additional nitrogen. However, grass growth should not be stimulated with fertilizer nitrogen to the point where it would eliminate the legumes.

Listed in Table 1 are the pH's of samples taken in August 1978. Initially, one major concern was that the acid from the spoil would move up into the topsoil, making it too acid for plant growth. Although there has been a decrease in pH of the topsoil, there has also been an increase in the pH of the spoil beneath the topsoil. Since the forage from the plots was not harvested, it appears that some of the bases from the topsoil moved into the spoil and acid from the spoil reduced the pH of the topsoil. After four growing seasons, the plant roots were found penetrating to within one-half inch of the spoil. After 11 growing seasons, plant roots were starting to penetrate into the spoil approximately one-fourth inch. The spoil was sampled from 0 to 0.5 inches and the pH measured. The pH's (Table 1) showed an increase as compared to the check, but pH was too low for good root growth.

The change in conditions suitable for root growth when a toxic spoil is covered with topsoil appears to be rather slow. Limestone mixed into the spoil ahead of topsoiling would probably speed up root penetration. This would become a more important consideration if shallow layers of topsoil were being applied or if steep slopes were being topsoiled where a root contact between the topsoil and spoil would reduced the possibility of the topsoil sliding.

This study shows that vegetation can be established on toxic spoil by topsoiling with a minimum of 6 inches of topsoil. Erosion control would be essential when the minimum depth of topsoil is used.

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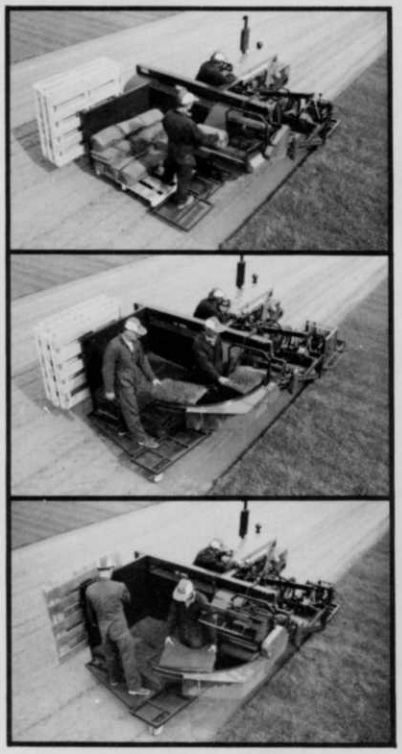

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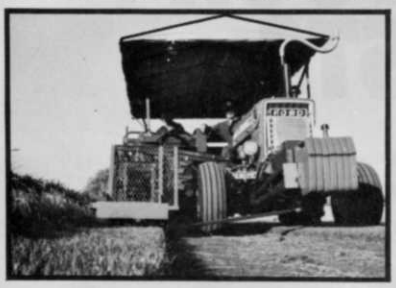

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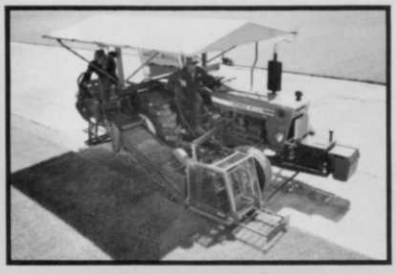

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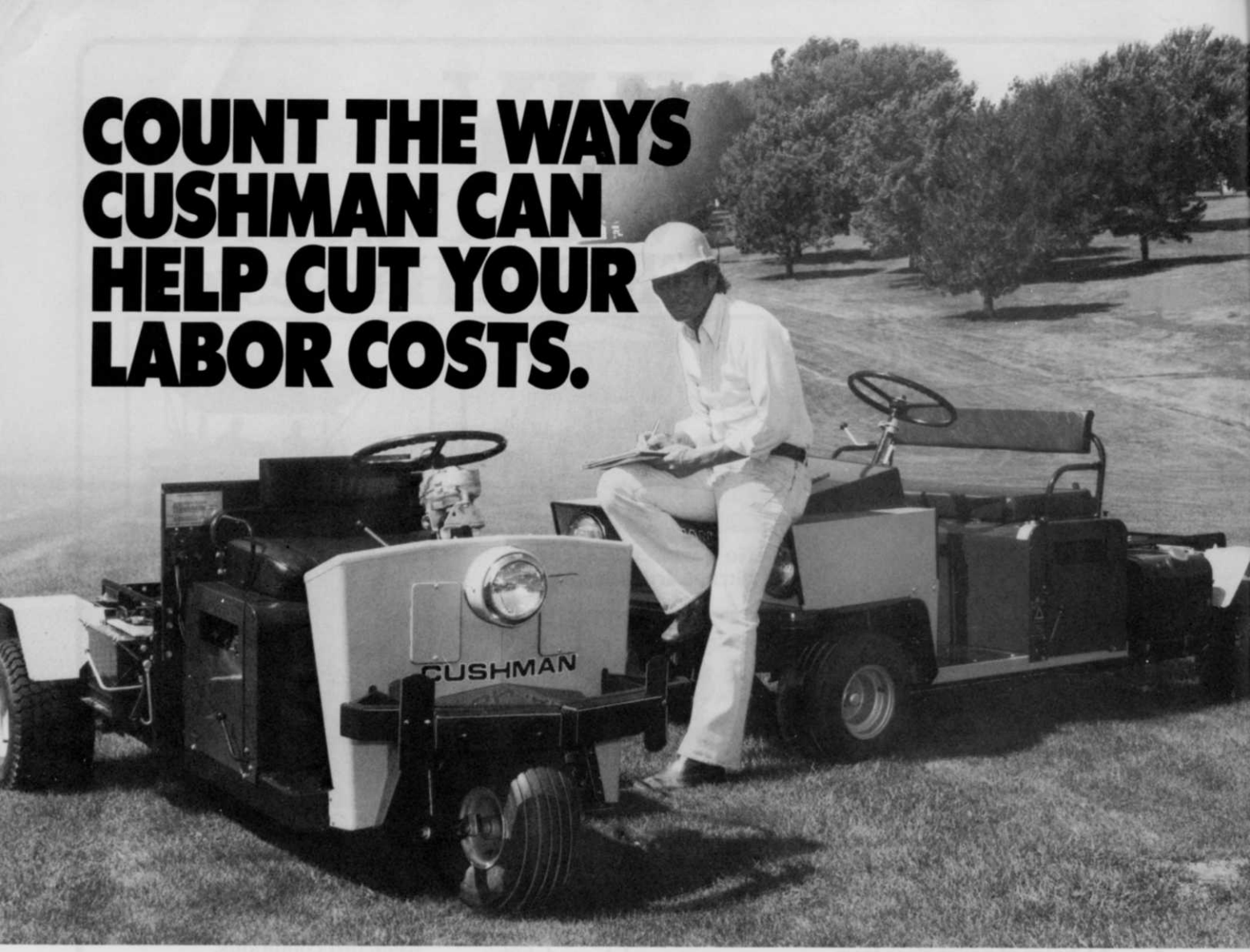

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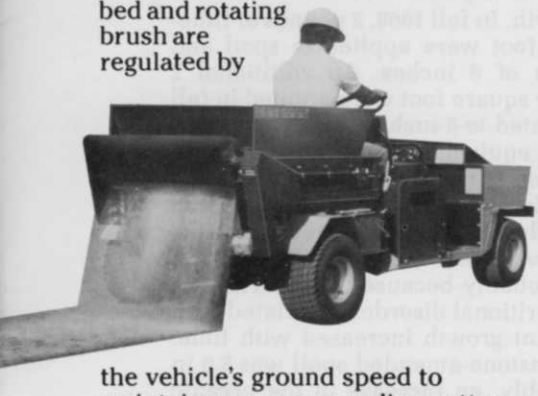

the vehicle's ground speed to maintain an even spreading pattern over a 31½″ swath. And the hopper holds up to 1,000 lbs. of material from rock salt to powdered fertilizer.

5. SPREADER/SEEDER.

Mounted on the optional Short Box or Flatbed/Box, its cyclone action spreads up to 300 pounds of seed, sand, salt or fertilizer over areas up to 40′ wide. The Spreader/Seeder is powered by the Turf-Truckster's optional PTO with extension shaft. And since all controls are operated from the driver's seat, one man can get the job done.

6. QUICK AERATOR.

We call it the Quick Aerator because its 46″ wide swath lets you finish big aerating jobs fast. It can also move from job to job fast, because it can be

hydraulically lifted by controls from the driver's seat for ground transport (optional hydraulic system and dump set required). Three tine styles are available for different soil conditions: slicing, coring (2 sizes) and open spoon.

7. GRADER/SCARIFIER.

Now you can groom non-turf areas with your Cushman Turf-Care System. Attach the new Grader/Scarifier to your Turf-Truckster and you're ready to break up compacted dirt on ball diamond infields or golf car pathways. As a professional grading tool, it will keep your grounds even, or create new surfaces. There's a built-on dragmat holder, driver-operated controls and an optional scarifier replacement bar with extra-close 1½″ tooth spacing.

8. POWER CONVERTER.

The Cushman Power Converter turns your Turf-Truckster into a mobile power plant for electric tools, floodlights . . . anything with a universal motor that draws up to 120 volts DC. So, instead of bringing every repair job back to the shop, your crew can handle them in the field. The Power Converter is inexpensive, easy to install and makes your Cushman System even more versatile.

9. CUSHMAN RUNABOUT.

If you need a vehicle for moving people and equipment efficiently, consider the Cushman Runabout. Either the two-man 18-hp Runabout, or the one-man 12-hp model. Both give you maneuverability and feature a big pick-up box, and 3-speed transmission. And both Runabout models let your crew get to the job without tying up a golf car that could be on the course earning a profit.

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Persistence *from page 22*

Also, the topsoil should be limed and fertilized according to soil test recommendations.

Sewage Sludge and Forages

Another study conducted on this spoil used sewage sludge to help establish vegetation. Digested sewage sludge was obtained from the Caldwell (Ohio) treatment plant. It was removed from the drying beds and applied to the spoil at the rate of 294 air dry tons per acre. One area had sludge incorporated with a disc to a depth of approximately 6 inches. In a nearby area, sludge was applied to the surface but not disked in.

Results

- at least 6 inches of topsoil is needed over toxic spoil for plant establishment
- fertilizer is necessary for initial growth
- additional fertilization is critical for growing in materials that consist largely of subsoil
- digested sewage sludge is an excellent material for reclaiming toxic spoils
- trees can be established on toxic spoil if enough topsoil is used to support root growth
- amendments should be thoroughly mixed with the spoil

In fall 1971, both areas were seeded to rye and in March 1972, Kentucky 31 tall fescue, orchardgrass, and sweet clover were broadcast seeded. The pH of the 0-4 inch layer was 5.4.

One initial question with the use of sewage sludge was: "Will the sludge oxidize over a period of time and the spoil become too acid to support plant growth?" This situation did not occur during seven growing seasons. Vegetative growth and the pH of the spoil indicates that this area will continue to support vegetation. Also, bluegrass has started to appear in part of the area.

Where the sewage sludge was not incorporated, vegetation was established but the plant roots were confined to the sludge layer. Although there was no visual difference in growth, this shallower root system may result in a more severe drought stress.

Limestone and Forages

In an earlier attempt to establish vegetation on this type of spoil, 31 tons per acre of limestone were applied but the spoil remained too acid to support plant growth. In fall 1969, 2 pounds of limestone per square foot were applied to spoil and mixed to a depth of 6 inches. An additional 2 pounds of lime per square foot were applied in fall 1970 and incorporated to 6 inches. Following these lime applications, equivalent to 87 tons per acre, the area was seeded to rye and fertilized with 544 lb/A 6-24-12. In March 1972, a mixture of Korean lespedeza, sweetclover, Kentucky 31 tall fescue, and orchardgrass was seeded. At first, plant growth was very poor, probably because of a shortage of moisture and a nutritional disorder associated with the acid spoil. Plant growth increased with time. The pH of the limestone-amended spoil was 5.6 in August 1978. Possibly, an increase in the organic matter of the spoil, resulting from the decay of plant roots, increased water infiltration and moisture availability.

When limestone is added to toxic spoil for establishing vegetation, a sufficient amount must be added to neutralize both the spoil acidity and the acid spoil. Plant growth increased with time. The pH of the limestone-amended spoil was 5.6 in August 1978. Possibly, an increase in the organic matter of the spoil, resulting from the decay of plant roots, increased water infiltration and moisture availability.

TABLE 1—The pH Values for Topsoil and Spoil with Different Treatments.

Treatments	Topsoil	Spoil 0-4" Under Topsoil	Spoil 0-0.5" Under Topsoil
	pH	pH	pH
2 inches topsoil	2.8	2.9	—
4 inches topsoil	4.5	2.8	—
6 inches topsoil	5.2	2.7	2.8
8 inches topsoil	5.5	2.9	3.0
10 inches topsoil	5.7	2.9	3.6
Check		2.4	

Topsoil and Trees

A study was conducted to establish trees on the outer slope of a toxic spoil by making holes approximately 12 inches in diameter and 15 inches deep. The holes were filled with soil and one-year-old black locust and European black locust and European alder trees were planted in spring 1969. Initial tree survival was good but growth was poor. After 10 growing seasons, the roots are confined to the soil material and the trees have made very little growth. In some cases, there was movement of acid into the soil and the trees died.

This method could be used if large enough holes were made to give a sufficient volume of soil for root growth to support the trees. In another area where 18 inches of nontoxic spoil were used to cover toxic spoil, trees have made relatively good growth and cover over a period of 8 years.

Summary

At least 6 inches of topsoil cover over toxic spoil was needed for establishment of healthy plants. Initial growth of grass without the addition of fertilizer was poor. This emphasizes the need for fertilizing in accordance with soil test recommendations. Also, maintenance applications of fertilizer may be needed to maintain a good vegetative cover. The need for additional applications of nitrogen will be critical where the forage stand consists of grasses growing on materials that largely consist of sub-soil.

Excellent plant growth was obtained with 294 tons per acre of air dry sewage sludge. Because of varying composition, each source of sewage sludge must be evaluated to determine its value in reclamation. If sludge does not contain substances detrimental to plant growth, it is an excellent material for use in reclaiming toxic spoils.

When sufficient quantities of limestone are added to neutralize most of the acidity, vegetation can be established. When large quantities are added, the limestone should be thoroughly mixed with the spoil to obtain a uniform pH throughout the mixing zone. Also, the area should be fertilized according to soil test recommendations. Regular soil tests used for undisturbed lands will not measure the acid-producing potential resulting from unoxidized sulfur in spoils. Direct oxidation of reduced sulfur to acid with hydrogen peroxide has been used to evaluate the acid potential of spoils.

Trees can be established on toxic spoil if a sufficient volume of topsoil is used to support root growth. Drainage should be good or acid seepage into the root zone may reduce growth or even Kill the tree. **WTT**

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VEGETATION MANAGEMENT

By **Roger Funk, Ph. D.,** Vice President Research and Development,
The Davey Tree Expert Company

Q: *How do you tell maple wilt from maple decline? Is there anything you can do to treat these diseases?*

A: Maple wilt is caused by the fungus *Verticillium albo-atrum* and is first evidenced by the sudden wilting and dying of leaves on individual limbs. Sometimes the wilting is preceded by a slight yellowing of the leaves. The sapwood may be discolored (olive-green), particularly near the base of the tree. However, since other fungi may cause a similar staining, a positive diagnosis can be made only by culturing the discolored tissue.

Infected trees may die within a few weeks or over a period of several years depending upon the degree of infection and whether the infection occurred through the roots or branches. Occasionally an infected tree will recover and "wall off" the infection with subsequent new growth.

Treatments with high nitrogen fertilizer in the spring have reportedly aided the walling-off process by stimulating new growth.

Maple decline is not associated with any particular insect or disease but apparently is caused by environmental and other abiotic factors. Among those suggested to trigger the decline are drought, road salt, mechanical injury and nutrient deficiencies. Other problems such as root rot are thought to be of a secondary nature.

The symptoms are twig and branch dieback involving initially the upper crown, premature fall coloration, chlorosis, scorch and leaf dwarfing. Sugar maples are more often affected than other maple species and appear to be especially susceptible along roadsides.

Fertilization with high nitrogen fertilizer often dramatically improves declining maples, particularly when supplemented with trunk injections of manganese salts. Of course, if road salts are involved, any action which would reduce the salts in the root area would be beneficial.

Q: *I have a myrtle bed where one-third of the plants are rotten or loose from the ground, needing to be raked out. Why is so much of the planting dead or loose? There has not been any change in bedding conditions.*

A: Assuming the myrtle to which you refer is *Vinca*, we have had reports of cases of both canker *(Phoma exigua)* and root rot *(Pellicularia filamentosa)* in your area of Pennsylvania. Both of these diseases can cause a dieback or decaying of stems and are usually more prevalent during rainy periods of the growing season.

Recommended controls include the removal of infected plant parts and a periodic soil drench with benlate (benomyl). Root rot is difficult to control in established plantings. Check with your local extension agent and/or refer to the product label for use and timing instructions.

Q: *Many so-called "tree surgeons" make much of their living from "topping" trees, even though they are aware that the practice is unsound. These specialists often perform this service at the request of ill-advised or uninformed homeowners. Can you recommend a way to eliminate this senseless tree butchering without hurting the income or reputation of tree surgeons?*

A: Topping not only is aesthetically unattractive but also results in weak crotches and a greater potential for decay in the "nests" of branches.

Topping requires less skill and time than selective pruning and allows an untrained person to "trim" a tree for less money than a more knowledgeable tree surgeon. Unfortunately, many homeowners are unable to appreciate the quality difference and judge service by the size of the bill.

We all need to do a better job of educating our industry as well as the public. Organizations such as the National Arborist Association (NAA) and the International Society of Arboriculture (ISA) help to set industry standards and promote public awareness. On a more local basis, each of us can become involved in community activities involving tree planting and maintenance, and participate in civic and garden club programs.

Q: *I have a garden center and during the summer I have to weed every ten days. I want to eliminate this as it can become very expensive. I keep the plants above ground, but what can I use to prevent weeds from coming up?*

A: Without knowing the major weeds or the nursery plants involved, I cannot recommend herbicides for application around a variety of existing plants.

Prior to bringing in the nursery plants, the area could be treated with an herbicide such as Roundup which would kill existing weeds but would not affect subsequent weed germination. Soil fumigants such a methyl bromide could also be applied and would control most weeds for a season. However, fumigants are dangerous and expensive to use and should be handled only by professionals.

Possibly the best solution would be to cover the area with black plastic and a light topping of organic mulch to provide a surface suitable for foot traffic.

Q: *What causes spit spot on oaks?*

A: We have not had many reports of spit spot, but in most cases it was associated with large, recently transplanted pin oaks. Generally, it appeared as small spots of froth or foam on the trunk and disappeared as the tree became established. To date we have been unable to associate an insect or disease with the spots. Perhaps one of the readers has a suggestion. **WTT**

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PRODUCTS

Compact Diesel Tractors: Versatility Plus Durability

Engineers have combined the versatility of the compact tractor with the durability and strength of the diesel engine to produce a useful professional tool.

These tractors, usually in the 16 to 30 h.p. range, provide landscape firms, industrial groundskeepers, and large estate and school maintenance supervisors with a front line or backup tool that has great flexibility and ruggedness. In times of tight budgets, such a tractor and its attachments could substitute for a single-function device and provide a backup for existing machinery during maintenance or repair.

The versatile, compact tractor is receiving serious attention by tractor manufacturers as one of the biggest growth markets in the equipment business in the next five to ten years. The lawn and garden tractor has

grown up into a professional grade machine.

Typical versatility with available attachments includes:

—reel, rotary, and flail mowing
—tilling and cultivating
—raking
—trenching
—discing
—posthole digging
—snow throwing
—backhoe and loader use

Bolens division of FMC Corp. and Iseki have combined resources to produce a line of water-cooled diesel tractors in the 15 to 24 h.p. range. All models are powered by four-cycle, two-cylinder water cooled diesel engines. The largest, 24-h.p. model, the G244 weighs 1,900 lbs. and is approximately four ft. wide and nine ft. long with a 58 in. wheelbase. The tractor includes a three-point hitch, hydraulically activated, and a two or three-speed PTO. A full line of attachments are available from Bolens. Available with switchable four-wheel drive.

Circle 701 on free information card

John Deere offers three diesel-powered compact tractors from 22 to 33 h.p. Called 850, 950, and 1050 models, the tractors are powered by

Continues on page 32

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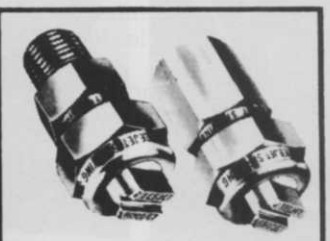

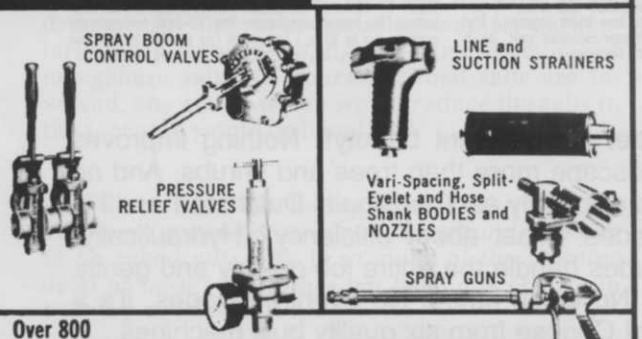

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Circle **132** on free information card

Diesel Tractors *from page 30*

three-cylinder, four-stroke water-cooled diesels. Front wheel drive is optional on the 950 and 1050 models. Special features are a two-stage clutch, differential lock, adjustable wheel spacing and optional power steering. Attachments available include planters, cultivators, discs, plows, loaders, backhoes, mowers, and box scraper.

Circle 702 on free information card

International Harvester just announced in September that it now offers a 30 h.p. diesel engine powered compact tractor. The 284D is powered by a three-cylinder diesel engine and is designed for small farm and grounds care operations. The two-speed PTO delivers 27 h.p. A position-controlled category 1, three-point hitch is standard equipment. Front-wheel drive attachment available provides four-wheel drive. The 284D is the latest addition to International's compact tractor line which includes gasoline powered models with 18.5 and 28 h.p.

Circle 703 on free information card

Kubota offers a line of compact diesel tractors from 18.5 to 34.5 h.p. and a full line of attachments. Called the L-Series, these diesel tractors have attachments to split logs, mow a five-ft. swath, load 1,000 lbs., disc a six-and -a-half ft. swath, plow, blow snow, scrape a seven ft. swath, and till.

Circle 704 on free information card

Satoh, one of the early manufacturers offering mid-sized diesel tractors in the U.S., has eight basic models ranging from 15 to 38 h.p. Six of the eight are available in two and

Continues on page 34

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Circle **135** on free information card

four wheel drive. Satoh equips its mid-sized tractors with professional features such as live hydraulics, multi-speed power take-off, high ground clearance, multi-capability implement hitching systems and multi-speed transmission. Currently, more than 1,000 dealerships offer Satoh in the U.S.

Circle 705 on free information card

White Farm Equipment Co. also offers the Iseki compact diesel tractor in 27 h.p. and 31 h.p. category. Called the Field Boss 2-30 and 2-35, the three-cylinder diesel powered tractors provide 540rpm speed PTO and weigh from 2,600 to 2,750 lbs. With 14-in. ground clearance and a 69-in. wheelbase, the Field Boss tractors can clear about anything. Available

with four wheel drive and power steering.

Circle 706 on free information card

Thirty h.p. Diesel Tractor for front-mounted rotary mowers by Bunton is a new step up from its 20 h.p. gasoline and diesel models. Mulching or side-discharge rotary mowers up to 71 in. can be attached, as well as rotary broom and snow plow. Bunton is also offering diesel engines on 36 and 52-in. self-propelled rotary mowers.

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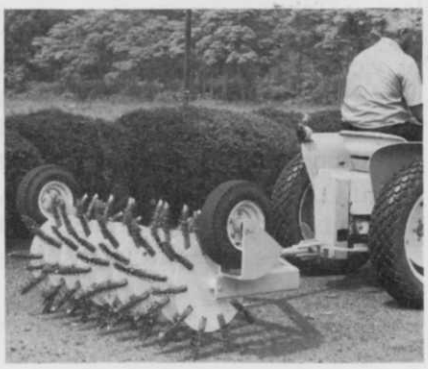
Tractor Attachments



Aerifiers by Hahn are available in four and six-ft. widths. The four-ft. AB-1 has nine free-wheeling discs holding up to 140 aerifier spoons or slicing blades. Flip over wheels provide simple transport to job site. A three-gang hook-up is available from

Continues on page 37

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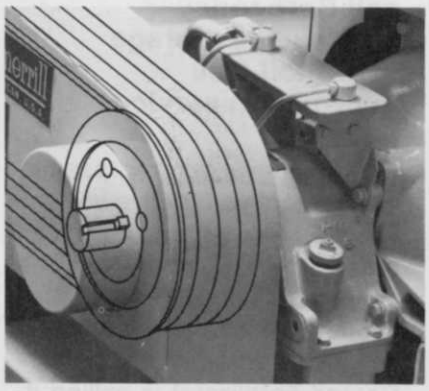

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Diesel Tractors

from page 34

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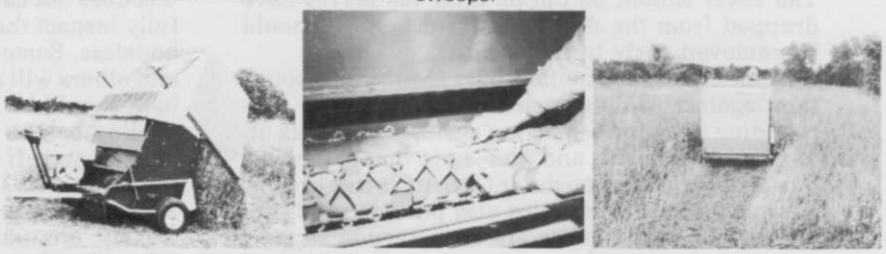

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Winter *from page 16*

Physical Protection — Heavy snow or ice cover can be injurious to many plants especially those with multiple leader stems such as taxus, arborvitae, upright juniper and others. Tying can help to prevent the plants from breaking. Tying should be done before the first snowfall. The twine or soft rope should be fastened at the base of the plant and wound spirally upward to the top and back down in reverse to compress the shrub's size.

Burlap is often used to screen out the drying effects of the wind and sun and also where winter hardiness is questionable. Before covering the plant with burlap it should be either tied or staked and then the burlap applied. Burlap can be used as a wind screen with a strip of it protecting the plants from the prevailing winds or it can be used as a complete cover by surrounding the entire plant. The cover should be put on after the leaves have dropped from the decidious shrubs and it should be removed early in the spring.

Lath can be used either over shrubs for protection against sliding roof-top snow or by surrounding them for protection against the drying effects of the wind and the sun. Snow fencing, burlap, evergreen boughs or Christmas tree greens, baskets and wooden crates also provide good protection. Whenever posts are necessary to support any type of physical protection they should be put in the ground before it freezes. The actual protector (burlap, lath etc.) should not be put around the plant until early winter.

The types of physical protection are endless since it is really a matter of common sense. Although I would like to mention that plastic should NEVER be used, for the plants under it will simply cook from the heat of the sun.

It is unfortunate that many forms of physical protection are not esthetically appealing in the landscape for they are a great tool in preventing winter damage and death of plant materials. It was interesting for me to discover just how little they are used in this area on commercial sites due to the added cost involved and the overall appearance of the landscape.

Sometimes during an unusual winter, damage occurs in spite of protective measures. Fortunately this does not happen very often but if it does, carefully inspect the plants before calling the situation hopeless. Some plants such as some forms of Ilex and others will appear to be dead. In such cases the bark should be inspected for signs of life by gently peeling back a little piece of it. If the plants are alive, prune off any of the obviously dead material. Injured plants should be carefully cared for during the following growing season by applying water at weekly intervals when rainfall is not plentiful. When the plant shows signs of recovery, by making new growth, an application of fertilizer is in order.

WTT

Municipal *from page 21*

phone numbers. The pamphlets explain the species of the tree that's been planted, its proper and common name, why it was planted there, and how to take care of it and water it.

Metz is also receiving help from the Ohio Department of Natural Resources to do a free inventory of all the trees. Senior citizens will help number the trees and mark their location.

People are taking advantage of the tree program and assisting in Bowling Green. The same response comes from Lancaster, PA, which has its own adopt-a-tree program. Diane Williams, city arborist, says, "I think people appreciate trees a little more because of a concern for the environment."

The residents of Lancaster may purchase a two-inch caliper tree wholesale from the city and assume full responsibility after it is planted. "We do occasional fertilizing and spraying for insects, such as aphids, which were prevalent this summer," Williams says. Yet the funds don't exist for more than emergency aid on the privately owned trees.

The city used to plant 100 trees a season, but now only 40. "The people want it, they appreciate it more, yet it's one of the last things to get funding and the first to be cut. A lot of people still consider it an extra," says Williams.

John Van Vorst, supervisor of parks, Tenafly, NJ, knows that even if he gets additional funding it won't be substantial as he is governed by a 5 percent a year increase. This year there was no increase. Van Vorst has found his own way to boost his revenue.

He receives about $1,000 a year in firewood sales from wood that in the past would have been thrown away or put in a landfill. Trees recently downed by Hurricane David were out and sold to residents. With this money he buys tulip bulbs, flowers, and other materials.

Autumn leaves put through a Royer shredder make a fine compost, which the park department sells to nurserymen and landscapers at $5 a yard. These sales produce about $2,000 a year. The city also saves by using the leaf compost instead of buying topsoil. Compost is free to all residents of Tenafly.

Van Vorst has saved dollars by planting many of his own flowers. "Anything that we're cost conscious about planting we try to breed from cuttings in our greenhouse," he says.

Other ways of cutting cost of maintenance include use of granular weed killers, such as Casoron, to eliminate hand trimming; Roundup on turf areas where grass is encroaching plant beds; and wood chips as buffer plantings. Van Vorst has cut his mowing schedule to every seven days for high use areas and every 10 days for low use areas.

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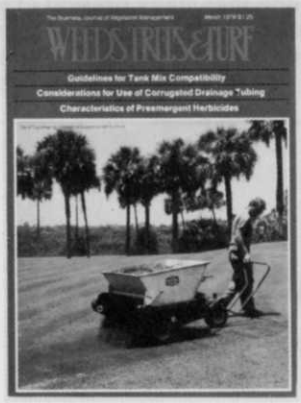

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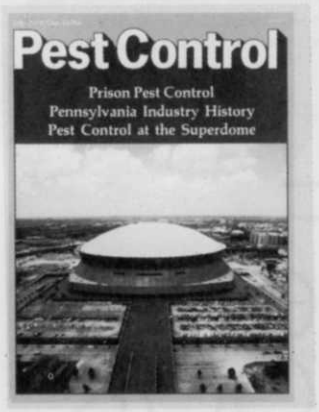

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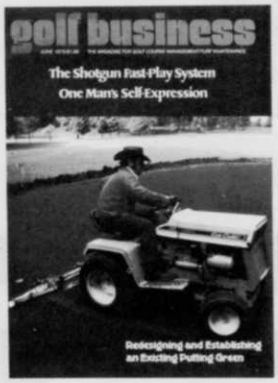

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sity; and Dr. Earl Barrios of Louisiana State University.

Duich, professor of Turfgrass Science at Pennsylvania State, spearheaded the development of Pennfine at the Pennsylvania Agricultural Experiment Station in the early 1960's.

Leading off the program was the discussion of annual bluegrass *(Poa annua)* control in overseedings. A variety of opinions existed among panel members regarding methods and products to control *Poa annua*. All agreed, however, that time of germination was a key to combating annual bluegrass.

Dr. Euel Coats expressed an observation that many present at the conference were probably somewhat overconscious of the overseeding weed problem this year because of a long growing season the previous fall, which contributed to an annual bluegrass situation that was worse than preceding years.

Coats discussed the use of bensulide for *Poa annua* control. He said that application of bensulide 120 days prior to overseeding provides "control of that first flush of annual bluegrass, which germinates, depending on where you are, sometime during the month of September." He added, "It would then depend on the competition from the overseeding for control of the annual bluegrass. So, quick establishment of overseeding is important to give competition," Coats added.

Duich backed up the effectiveness of bensulide as a pre-emergence material. The Pennsylvania Agricultural Experiment Station has researched the chemical for 14 years on bentgrass. Though Duich and his colleagues in Pennsylvania aren't involved in an overseeding situation, Duich did comment on another chemical, EL-222, that has shown promising results in field tests.

EL-222 is a systemic herbicide that has two properties, according to Duich. "One is pre-emergence, the other is post-emergence control. The post-emergence control of EL-222 is unique in that we can get a very gradual weakening of *Poa annua*. This is the type of effect we'd like to get at transition, particularly for bent increase and takeover and a gradual decline of *Poa annua*," Duich added.

There is a continuing need for research to determine exactly when *Poa annua* germinates, according to Dr. Coleman Ward. He commented that it is difficult to know the exact germination date because "it remains very juvenile and we just don't see it."

During years of close observation, Ward has seen the approximate date of *Poa annua* germination pushed back from October 1 to about September 1, and as early as late August in areas 100 miles north of the Gulf Coast. "So I think utilizing applying something like bensulide about 60 days prior to the date of overseeding does give fairly effective control. The big problem is, of course, the weather. I think it's widely known that the vagaries of the weather will cause difference in when *Poa annua* will germinate," Ward added.

Continues on page 42

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Overseeding *from page 40*

Echoing the belief that timing is vital in the control of *Poa annua*, Dr. Ray Dickens related that he overseeded half a test plot three weeks prior to the normal overseeding date. The other half was overseeded three weeks later than usual. "The early overseeding area was essentially clean of *Poa annua*; the late overseeding area had a pretty severe bluegrass infestation. With perennial ryes and better herbicides, we've been moving overseeding a little bit earlier. The results have shown 85-95 percent control of annual bluegrass just from a good, aggressive stand-off of ryegrasses," he added.

Dickens further commented that early overseeding got stiff competition from Bermuda grass. The stands on the early overseeding test plot were thin for quite a while; the later plot was overseeded after the Bermuda had finished its competition, resulting in heavy stands. Agreeing with Ward, Dickens also called for more knowledge of *Poa annua* activity in the South. He added: "We still don't know exactly when it germinates or what causes it to germinate. Something like bensulide either controls dormant seeds, or *Poa annua* germinates earlier than we believed. I think the latter is probably true."

Discussing the future of *Poa annua* control, Dr. Ward commented, "We need to find a more effective and simpler way of providing control prior to overseeding. And, obviously, the fewer seeds we have come through on *Poa annua*, the less the problem. "We should eventually be able to get to where we won't have a *Poa annua* control on the green, if we can prevent seedhead formation. And this is another area we need to research," Ward added.

Looking at other methods of possible annual bluegrass control, Howard Kaerwer of Northrup King Co. noted that, based on his observations, early aerification usually results in less germination of *Poa annua* than does aerification later in the fall. "If you get your green cleaned up the year before, you won't see much *Poa annua* the following year.

"Despite the fact that there are *Poa annua* seeds on the ground," Kaerwer added, "there is something that happens during this hot period that keeps them from germinating. "I think that there are many mechanical or management things that can be done to control *Poa annua*. If we knew more about it, much of the control could be handled by mechanical or management means rather than by going the chemical route."

Moving on to the subject of variety selection, Dr. Ray Dickens commented that healthy greens result more from overseeding management practices than from seed varieties. He continued that variety differences could be rated in terms of "color, dark and light. But when you plant two greens, two fairways apart, most people don't know that you've got two varieties on them," Dickens said. "We've got so many to choose from that the competition is going to result in a pricing sort of situation," he con-

Continues on page 44

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Overseeding *from page 42*

cluded.

Dr. Jeff Krans discussed the role of perennial ryegrasses in the overseeding process. He said, "Perennial ryegrass normally, in the majority of overseeding mixtures, handles the base grass and within this we add other, cool season grasses.

Krans agreed with Dickens that management, more than variety, determines whether a green will be good or poor. "The management, or how you establish the grass, far outweighs your variety selection. The addition of other grasses to perennial ryegrass is something that has real potential, as far as putting in a fine leaf fescue or a *Poa trivialis*, a bent grass or a Kentucky bluegrass," Krans said.

Opening up a discussion of methods and rates of overseeding, Kaerwer commented: "This whole business is an art based on science, but it still has a tremendous amount of art. Each golf course is different, as is each weather condition. These all have influences. In short, to overseed properly, you need to start preparing for it a year before. "Basically you want good, healthy Bermuda grass. You don't want thatch. The equipment and technology available today to keep thatch out are excellent. However, one of the bigger problems we face is the control of Bermuda grass, because it tends to push the ryegrass out during that establishment period.

"Healthy Bermuda grass with no thatch means starting in the spring. You need to have your soil and your green as open to aerification and moisture drainage as possible, plus you need air drainage. You want to be able to keep your grass in a condition that will allow it to be as dry above the ground as possible with moisture to the root system. Your fertility program comes in here. When overseeding, you don't want Bermuda grass growing rapidly. You want to slow it down and this means reducing predator overseeding. To do this, you can cut down your fertility. Then the best procedure could be to scalp down somewhat, or mow it, to open up pathways to get the seed down as close to the ground as possible," Kaerwer added.

Dr. Coleman Ward termed "ineffective" the practice of initially putting down half the intended amount of seed, and overseeding with the remaining amount a few months later. "Let's say that half the seed is put out around October 1, and the other half later on January 1. The percentage of seed that survived from the January 1 overseeding wouldn't exceed 5 percent. This is just an observation I've made but I think that it's a problem we need some hard answers on because a lot of superintendents are doing this," Ward commented.

Ward advised against aerification of a *Poa annua* infested green. "When you put down a preemergent herbicide to control *Poa annua*, you should never aerify subsequent to overseeding. You're going to bring up *Poa annua* seed with that aerification. If you feel your greens absolutely need help, I'd recomment slicing them. In fact, if I had greens where *Poa annua* was a serious problem, I wouldn't put an aerifier on that green," Ward said. **WTT**

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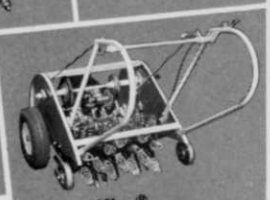

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The TUFLEX manufacturing process allows a five year warranty on all tanks.

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Plant Location: 800 Eller Drive, Port Everglades in Fort Lauderdale

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CLASSIFIEDS

HELP WANTED

GOLF COURSE TURF PROFESSIONALS: An opportunity to sell Pro Turf© products. ProTurf Division of O.M. Scott & Sons, the nation's leading manufacturer and marketer of professional turf products, has openings for Technical Representatives in several territories. The Tech Reps selected will call on golf course superintendents, requiring a knowledge of turf management and an understanding of these professionals' needs. Applicant should have a BS degree or equivalent in one of the agronomic sciences. Excellent starting salary plus bonus, automobile, and a comprehensive benefits program at no cost to employees go along with these positions. Send resume in confidence to Dick Stahl, Director of ProTurf, O.M. Scott & Sons, Marysville, Ohio 43040. An equal opportunity employer.

LANDSCAPE ARCHITECT WANTED: Plan, design and coordinate construction of preserve improvements. Requires degree in land architecture or related field. Salary negotiable. Contact Judy Dolan, Forest Preserve District of Will County. 815 727-8700.

POSITION AVAILABLE coordinating sod growing and sales on two farms; some travel; southern U.S.; background in horticulture or agronomy. Salary plus bonus. Please send complete resume to Box 231, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

LOOKING FOR EXPERIENCED PERSON who has knowledge of tree & landscape business. Must be able to take charge of complete operation & have sales ability. Must have a good business background. Salary plus bonus depending on qualifications. Send resume & salary requirements or call: A-1 Tree & Landscape Co., 50 Flushing Pond Rd., Westford, Mass. 01886. 617 692-3166, 692-7825, 453-3736.

URBAN HORTICULTURE—small farms advisor. Santa Clara County location. Conduct Extension education program for urban gardeners, agency personnel and educational institutions in application of good agricultural principles in maintenance of home and public grounds, home food production. Established educational and applied agricultural research needs of small farmers, part time farmers, and limited resource families. Disseminate information through meetings, demonstrations, news letters, other mass media. B.S. in vegetable crops, pomology or ornamental horticulture required: M.S. preferred. Contact: Personnel Administrator Cooperative Extension, 331 University Hall, University of California, Berkeley, California 94720. Closing date: December 7, 1979. Refer to no. 7924. An equal opportunity

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WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. McKay Golf & Country Club Properties, 15553 N. East St., Lansing, Michigan 48906. Phone 517 484-7726.

LEARN LANDSCAPING and the Growing of Plants at home. Start a satisfying business or hobby. Free booklet. Lifetime Career Schools, Dept. A-610, 2251 Barry Avenue, Los Angeles, Ca. 90064.

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URBAN FORESTER desires a position with full responsibility for planning, organizing and directing a municipal forestry department. 5 years experience with the city of Chicago as an Urban

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Forester and Nursery Foreman. Background incorporates both management and technical levels of experience. B.S. Forestry, married, age 30, resume upon request. Box 233, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

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HI-RANGER 54' and other aerial buckets. 2 Asplundh brush chippers, Prentice hyd. loader, chipper truck, John Bean 20 g.p.m. sprayer, 4 & 9 ton tag-along trailer. Allied Enterprises, Inc., W204 N11509 Goldendale Rd., Germantown, Wi. 53022. Phone 414 255-6161.

MORBARK CHIPPER, Hydro-Ax and aerial buckets available for short and long term lease. Contact P. C. Gould Sales Co., Plains Road, Essex, Conn. 06426, 203 767-1636.

12" MITTS & MERRILL fully reconditioned 4 cyl. 172 rebuilt & guaranteed 6 months by Ford Motor Co., $3,300.00. 12" Asplundh chipper-needs a power unit, $1,450.00. 12" Asplundh-needs power unit & cutter head rebuilt, $895.00. Edwards Tree Service, 49090 Cooper Foster Park, Amherst, Ohio 44001. 216 988-4477.

HI-RANGERS AERIAL BASKETS 65', 57', 53'. Skyworkers aerial baskets 65', 50', 40'. Vermeer stump cutter 1560, 6. Vermeer tree spade 66, TS 44. Asplundh bucket and brush chippers. Bean sprayer, 9 ton trailer. Parkway Tree Service, 12026 W. Cherry, Wauwatosa, Wisc. 53226. 414 257-1555.

1-1973 VERMEER 66" tree spade, mounted on '73 C-60 GMC twin-screw truck. Good condition, ready to work. $19,500.00. Southern Trees, 11608 Joance Lane, Jacksonville, FL 32217. 904 268-6366.

FOR SALE: We specialize in the design and manufacture of heavy duty right-of-way and turf spraying equipment. We will quote on chassis and spray equipment or spray equipment only. Also distributor for hose, reels, pumps, winches and herbicides. K. W. Reese, Inc., Box 298, Mercersburg, Pennsylvania 17236. 717 328-5520.

STUMP CUTTER, VERMEER 1560, very good condition. Sheehan Tree Service, 1944 Ridge Road, West, Rochester, N.Y. 14626. 716 225-1850.

WANT TO TRADE—Ryan Greensaire III for Hahn TM 140 or similar aerator plus cash. Greensaire is 78 model, very little use. Write Box 232, Weeds, Trees & Turf, Box 6951, Cleveland, Ohio 44101.

FOR SALE: Pixstone rock picker, good condition, rebuilt gas engine, $1,200.00. Call Tom Ripley, Willow Grove, Pa. 215 784-4289.

1974 MITTS & MERRILL 16" wood chipper. Good condition, ready to work, $4500. Neal's Tree Experts, 608 Fifth Avenue, Larchmont, New York. 914 834-2080.

FOR SALE: Used Spyder forklift. Good condition. Bargain. Contact Weldon Crowsey. 713 342-6106.

END-DUMP 25' semi trailer with FOBC Prentice loader. Tractor 1969 White with 250 Cummins, 10 speed, ideal for log loading and dumping. Good condition, $15,-500.00. Minnesota Tree, Inc., Mpls., Mn. Phone 612 937-9770.

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TURF GRASS SEEDS. All improved varieties suitable for Canadian conditions, custom mixtures, and Prill-On coated seeds. Oseco, Inc., P.O. Box 219, Brampton, Ontario, Canada, L6V 2L2. Phone 416 846-5080.

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LANDSCAPE CONTRACTING and maintenance business: Among top firms in Chicago and adjacent six county area. Blue chip, long-term accounts. Over two million dollars gross-good net. Fully equipped, good shop, office, 14 acre yard and irrigated lath houses. Modern and diversified equipment. Fully staffed with trained and professional personnel. Owner will remain for several years if desired. Business mix 60% contracting. Will sell contracting business separate. Complete disclosure to qualified buyer upon contracting. George H. Cumpata, C.P.A., 707 Davis Rd., Elgin, Illinois 60120. 312 697-6161.

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"KNOW pH INSTANTLY. Electronic tester, portable, handheld. For soil, liquids, etc. $21. Details free. A & H Marketing, Dept. W3, 8325 Dru Ave. SE, Albuquerque, NM 87108. Phone 505 266-4821."

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

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WT&T EVENTS

Texas Turfgrass Conference, Texas A&M Conference Center, College Station, TX, **Dec. 3-5.** Contact Dr. Richard Duble, Department of Soil and Crop Science, Texas A&M University, College Station, TX 77843, 713-845-1551.

Delaware Turfgrass Association Annual Meeting, Hercules Country Club, **Dec. 4.** Contact: Dr. William Mitchell, Agriculture Hall, University of Delaware, Newark, DE 19711.

Ohio Turfgrass Conference, Cincinnati Exposition Center, **Dec. 4-6.** Contact: Dr. David Martin, 1827 Neil Ave., Columbus, OH 43210, 614-422-2592.

Symposium on Surface Mining Hydrology, Sedimentology, and Reclamation, University of Kentucky, Lexington, KY, **Dec. 4-7.** Contact: Mrs. Sue Hill, Continuing Education — Engineering, 779 Anderson Hall, University of Kentucky, Lexington, KY 40506, 606-257-3971.

Oklahoma Turfgrass Research Foundation Annual Meeting, Lincoln Plaza, Oklahoma City, OK, **Dec. 6-8.** Contact: R.V. Sturgeon, 115 Life Science East, Oklahoma State University, Stillwater, OK 74074.

National Agricultural Aviation Association Convention & Exposition, Las Vegas, NV, **Dec. 10-13.** Contact Sue Shaffer, registration chairman, Suite 459-National Press Building, Washington, D.C. 20045.

20th Illinois Turfgrass Conference and Regional Show, Ramada Inn, Champaign, IL, **Dec. 18-20.** Contact: John R. Street, 106D Horticulture Field Lab, University of Illinois, Urbana, IL 61801, 217-333-7847.

Maryland Turfgrass '80, Baltimore Convention Center, **Jan. 6-9.** Contact: Dr. David Wehner, Dept. of Agronomy, University of Maryland, College Park, MD 20742, 301-454-3715.

Northeastern Weed Science Society Annual Meeting, Grossinger Hotel and Country Club, Grossinger, NY, **Jan. 8-10.** Contact: J.V. Parochetti, USDA SEA-Extension, Room 5535 South Bldg., Washington, DC 20250.

New Hampshire Turf Conference, Sheraton-Wayfarer Motor Inn, Bedford, NH, **Jan. 10-11.** Contact: John Roberts, Plant Science, Nesmith Hall, University of New Hampshire, Durham, NH 03824.

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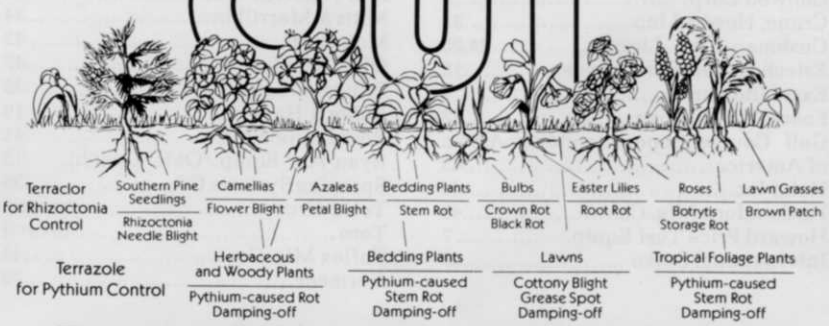
AW, CUT IT OUT



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Events *from page 47*

50th Annual Michigan Turfgrass Conference, Michigan State University, E. Lansing, MI, **Jan. 15-16.** Contact: Thomas Smith, 323 Agriculture Hall, Michigan State University, E. Lansing, MI 48824.

Southern Weed Science Society Annual Meeting, Arlington Hotel, Hot Springs, AR, **Jan. 15-17.** Contact: Jerry Weber, North Carolina State University, Weed Science Center, 3123 Ligon St., Raleigh, NC 27607.

Mid-Am Trade Show, Rosemont, IL, **Jan. 20-23.** Contact: Mid-Am Trade Show, 4300-L Lincoln Ave., Rolling Meadows, IL 60008, 312-359-8160.

Landscape Ontario Annual Congress, Sheraton Centre Hotel, Toronto, Ontario, Canada, **Jan. 22-24.** Contact: Robert Cheesman, Landscape Ontario, 103-3034 Palstan Rd., Mississauga, Ontario, Canada, L4Y 2Z6, 416-276-6177.

Virginia Turfgrass Conference, Fort Magruder Inn, Williamsburg, VA, **Jan. 30-31.** Contact: J.F. Shoulders, Ext. Specialist-Turf, College of Agriculture and Life Sciences, Virginia Polytechnic and State University, Blacksburg, VA 24061.

Annual Turf & Landscape Conference, Tappan Zee Inn, Mountain View Ave., Nyack, NY, **Jan. 30.** Contact: Frank Claps, 136 Laurel Ave., Larchmont, NY 10538, 914-834-6846.

ALCA Annual Meeting and Trade Exhibit, Town and Country Hotel, San Diego, CA, **Feb. 3-8.** Contact: Associated Landscape Contractors of America, 1750 Old Meadow Rd., McLean, VA 22102, 703-821-8611.

Wastewater Irrigation Course, Denver, CO, **Feb. 5-7.** Contact: The Irrigation Association, 13975 Connecticut Ave., Silver Spring, MD, 20906, 301-871-8188.

National Arborist Association Winter Meeting, Orlando Hyatt House, Orlando, FL, **Feb. 17-21.** Contact: Bob Felix, 3537 Stratford Rd., Wantagh, NY 11793, 516-221-3082.

Northwest Pest Control Conference on Integrated Pest Management, Spokane Sheraton Hotel, Spokane, WA, **Feb. 22-25.** Contact: Chris Senske, P.O. Box 6258, Kennewick, WA 99336, 509-783-5461.

American Sod Producers Association Winter Meeting, Disney World, Orlando, FL, **Feb. 24-28.** Contact: ASPA, 9th and Minnesota, Hastings, NE, 68901, 402-463-5691.

Pennsylvania Turfgrass Conference, Hershey Motor Lodge and Convention Center, Hershey, PA, **Feb. 26-29.** Contact: Arthur Wick, P.O. Box 362, Sewickley, PA, 15143 or Christine King, Pennsylvania Turfgrass Council, 412 Blanchard St., Bellefonte, PA 16823.

Connecticut Groundskeepers Association, Conference, Hartford Civic Center, Hartford, CT, **Feb. 27.** Contact: Glenn Moore, 141 Hemlock Hill Rd, New Canaan, CT, 06840.

First Agri-Turf Irrigation Exposition and Technical Conference, Houston, TX, **Feb. 24-27.** Contact: The Irrigation Association, 13975 Connecticut Ave., Silver Spring, MD, 20906, 301-871-8188.

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You're looking at just a few of the features that make this versatile midsize rotary mower so durable and productive.

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For now, we'll tell you the Groundsmaster 52® mows like a garden tractor, trims close like a walk mower and lets one man do both. With optional attachments, it's a year 'round workhorse with everything from vacuum to snowblower to V-plow to broom.

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Lofts/Maryland
Landover, Md. 20785
301-322-8111

Arnold Palmer discusses his overseeding program at Bay Hill with Peter Loft.

Note: The Bay Hill Club and Lodge will host the Florida Citrus Golf Classic.